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URBAN NUISANCE WILDLIFE CONTROL IN KENTUCKY

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variety of factors including increased urbanization, decreased funding for governmental animal damage programs, and increases in some urban wildlife populations have resulted in a greater demand for urban nuisance wildlife control. Historically, this demand was met by Cooperative Extension Service (San Julian 1987), state fish and wildlife agency, or USDA-APHIS-ADC employees (Bollengier 1987). These agencies provided educational materials, consultations, and/or physically removed animals. Recently, there is an increased demand for physical animal removal evidenced by increasing numbers of private pest control operators (PCO) specializing as urban nuisance wildlife control operators (NWCO).

Previous animal damage survey research has focused on the magnitude and distribution of wildlife damage, stakeholders' tolerance levels, and management preferences for solving human-wildlife conflicts (Pomerantz et al. 1986). Much of this research has been directed towards rural landowner attitudes concerning deer, gobse, beaver, black bear, or coyote damage (reviewed by Craven et al. 1992). Little detailed information exists about the urban nuisance wildlife control industry. The purpose of this study was to determine the status of the nuisance wildlife control industry in Kentucky, what level of technical training NWCO have relative to nuisance wildlife control, and what techniques are used by NWCO to prevent, control, or manage urban nuisance wildlife.

Thomas Grider, Department of Rural Sociology, University of Kentucky assisted with survey design. Michael Lacki and Thomas Grider reviewed an earlier draft of this manuscript. This research was funded by the Kentucky Agricultural Experiment Station.

MEITiODS

I designed an 8 page, 28 question telephone survey to assess the status of an emerging new wildlife management enterprise, urban nuisance wildlife control. The questionnaires were designed to provide information on: 1) the general nature of the pest control industry in Kentucky, 2) level of education and specific wildlife related training of NWCO as it relates to their views on certification or licensing, and 3) the views and experiences of NWCO on controlling nuisance wildlife. Names and telephone numbers of private PCO companies in Kentucky were obtained by searching the yellow pages of all telephone directories in the commonwealth of Kentucky. Additional companies were identified through the Kentucky Department of Fish and Wildlife Resources (KDFWR) nuisance wildlife control permit holder listing, referrals from PCO, and personal knowledge of NWCO companies operating in the state. Once this list was obtained, duplicate companies or those working in different cities with a main office in another city were eliminated. Branch offices of the three largest companies, greater than 100 employees, were not contacted because the questionnaire was answered by the company manager/owner for all company offices in the state. The questionnaire was pretested on 5% of the sample population during late

April 1992. At least 20 attempts were made to contact the owner or manager of a company before the company was no longer contacted.

The state of Kentucky was selected as a study area because it is representative of the United States and contains urban areas of various sizes including: 1) a large, metropolitan area with a population greater than 1 million (Northern Kentucky/Cincinnati, OH), 2) medium sized cities (Louisville, population 650,000 and Lexington, population 225,000), and numerous small urban areas ranging in population from several thousand (Frankfort) to 50,000 (Paducah).

RESULTS AND DISCUSSION

Usable questionnaires were obtained from 169 (89.9% response rate) of 188 PCOs contacted. Response rates of 90% or more minimize the effects of nonresponse bias (Houseman 1953); therefore, nonresponse bias was not considered a problem for this survey.

Three distinct types of PCOs, based upon what type of pest control work the company provided, were identified from the respondents. The largest group was classified as general PCO doing some nuisance wildlife control (N = 77). These companies did not specialize in nuisance wildlife control but did respond to customer complaints that involved at least one wildlife species (table 1) excluding domestic cats (Felis domesticus), house mice (Mus musculus) or rats (Rattus spp.). The other groups consisted of general pest or insect control companies (N = 69) that did no nuisance wildlife control and companies specializing in nuisance wildlife control (N = 23). Fifty nine percent of all PCO either specialized as NWCO or did some nuisance wildlife control. This is much higher percentage than the 48% of PCO doing nuisance wildlife control work reported by Goldstein (1992). The study by Goldstein should be viewed with caution, because a response rate of 18% indicates some of the results may be biased (Houseman 1953). The general trend reported by Goldstein (1992) and this study showed that the majority of PCO companies do some nuisance wildlife control and less than 20% of these companies are specializing as NWCO.

The pest control industry in Kentucky employs over 1400 individuals by at least 188 companies. Three and one-half percent of these individuals and 13.6% of the companies are NWCO. NWCO have been in business an average of 3.18 _+ 2.5 years. This is sharply different from PCO not specializing in nuisance wildlife control. These companies have been in business an average of 19.5 _+ 14.8 years. This information indicates NWCO are new business enterprises filling a need that may have been supplied by other governmental agencies in the past. PCOs also perceive nuisance wildlife control as a growing field (Goldstein 1992). Further evidence of a growing industry is the formation of the Urban Wildlife Control Association (Mike Dwyer, personal communication).

The NW CO are primarily located in urban areas: 39% in Louisville, 22% in Lexington, 4% Northern Kentucky/Cincinnati, and 35% in 7 different communities with more than 10,000 population and less than 50,000 population. This indicates NWCO are likely to be located in large or small communities and a minimum population of 10,000 may be necessary to support at least one NWCO. NWCO in smaller communities may not be a full-time PCO or NWCO. Ten (43.5%) of the NWCO consider the business as a fulltime endeavor; whereas, 13 (56.5%) of the NWCO only work in nuisance wildlife

control part-time. Six (46%) of the part-time NWCO are located in small communities; whereas, five (38%) are located in Louisville. The average percent time devoted to controlling nuisance wildlife by these companies was 11.9 + 4.6%. These findings compare favorably with results reported by Goldstein (1992). He found that 85% of PCOs said nuisance wildlife control accounted for less than 10% of their business.

Formal education level of NWCO varied; although, the majority (78.3%) were high school graduates or had attended at least one year of college. Specialized training in wildlife management and animal damage control subjects also varied (Figure 1). Few of the NWCO received specialized training in wildlife identification, trapper education, or animal damage management (Figure 1). When questioned about their ability to identify endangered bat species, 22% of the NWCO felt they could identify endangered or threatened bat species within the state. Many (40%) of these NWCO indicated they used books to train themselves or had no training (20%) in endangered bat identification. Other NWCO indicated they had received training in bat identification from a company (20%) or university (20%). Approximately one-third of NWCO were certified to use restricted use chemicals and received training in pesticide usage and entomology (Figure 1).

Many respondents indicated personal experience, not formal education or specialized training, allowed them to be qualified to be a NWCO. However, the majority of respondents felt NWCO should be certified (86.9%) and the following specialized training should be required for this certification: inservice training from the Cooperative Extension Service or a fish & wildlife department (87.0%), a trapper education course (87.0%), a course on the identification of endangered and threatened wildlife species (87%), and continuing education courses to maintain certification (82.6%). A minority of respondents felt college level training in wildlife management was necessary (13.0%) or testing was necessary to obtain certification (26.1%).

A follow-up question was asked on where they obtained their information about controlling nuisance wildlife. Most respondents contacted the KDFWR (29.7%) or read magazines (18.9%). Other sources of information included the Cooperative Extension Service (10.8%), personal experience (10.8%), company training programs (8.1%), USDA-APHIS-ADC (8.1%), mass media including television or radio (5.5%), and other sources (8.1%).

The questions of education or training and obtaining a license or certification to be a NWCO is important, as 90% of states require a permit but only 73% of states require testing as part of this process (Clark 1992). Connecticut and Illinois are the only states that require NWCO to take an examination and apply for a permit before being licensed (Kevin Clark, personal communication). Kentucky is similar to other states in that the only legal requirement to control nuisance wildlife in Kentucky is a NWCO permit. This permit is available for a small fee from the KDFWR. There is no testing or educational requirements to be a NWCO in Kentucky. I found 70% of NWCO were in possession of the required permit when surveyed. However, none of the 77 companies doing some nuisance wildlife control had the necessary permit. This concurs with (Clark 1992) who found many NWCO trappers operate without a permit.

It is apparent most NWCO contacted in this study do not have extensive training in wildlife management, trapper education or animal damage management. However, they support NWCO being certified concomitant with necessary educational requirements. Clark (1992) found similar results. They found 73% of NWCO do not have to pass a

test to obtain a permit, yet 76% support testing to obtain a permit and 71 % support certification for NWCO. These results suggest NWCO are eager for training and desire some industry self-regulation measures.

Most NWCO (95.7%) give customers free advice on solving nuisance wildlife problems and refer customers (78.3%) to other agencies or companies for problems they cannot handle (Figure 2). **NWCO reported raccoon** ft lotor) (28.5%) and tree squirrel (Sciurus spp.) (25%) problems generate most of their calls. Other species that generate most of the IVWCO business include skunks (Mephitis mephitis) (14.3%), opossum (Didelphis virginianus) (10.7%), beaver (Castor canadensis) (7.1%), birds (7.1%), and other mammals (7.1%).

Overall, NWCO reported their primary method of controlling nuisance wildlife was the use of live-trapping and releasing off-site (91.3%), followed by exclusion (8.7%). Secondary control methods varied and included the use of lethal traps (33.0%), livetrapping and euthanizing (27.8%), shooting (16.7%), and the use of leg-hold traps (16.7%). Other studies have shown livetrapping is the NWCO preferred control option (Braband and Clark 1992, Goldstein 1992).

Control methods used for specific animals or animal groups varied (table 1). Livetrapping and releasing off-site was the method used most often for tree squirrels, eastern chipmunks (Tamius striatus), woodchucks (Marmots monax), skunks, small carnivores including raccoon, opossum, weasels or mink (Mustela spp.), coyotes or foxes (Cams spp.) and white-tailed deer (Odoc~ileus virginianus). Control methods for other nuisance wildlife varied and included the use of lethal trapping for mole control, use of repellents and exclusion for pest bird control, exclusion for bat control and physical removal of a snake from a dwelling.

The use of illegal methods for controlling nuisance wildlife varied. Toxicants were used illegally to control bats, squirrels, skunks, and small carnivores. There are no toxicants registered in the state of Kentucky for use on these species. Habitat modification or exclusion were not preferred control options for most species except bats or birds. This is not surprising since 38% of NWCO companies do not consider repair or exclusion as part of their job (Goldstein 1992). In addition, 34.8% of the NWCO contacted for this survey guaranteed their work. Of this number, 62.5% guaranteed to solve the problem and the remaining companies offered a time guarantee (a specific amount of time for which no damage would occur). The typical guaranteed time period was 30 to 60 days post treatment.

The preferred control methods NWCO use to control nuisance wildlife appear to be dictated by what technology is available for controlling various pests (table 1), individual attitudes concerning lethal control, customer attitudes concerning lethal control and the humaneness of various control methodologies (Braband and Clark 1992). NWCO in this study approved of lethal control for woodchucks (56.5%), coyotes or foxes (60.1%), skunks (60.9%), pigeons (78.3%), other pest birds (82.6%), and commensal rodents (100%). NWCO disapproved (approval rates in parenthesis) of lethal control for waterfowl (0%), woodpeckers (13.0%), bats (13.0%), deer (13.0%), squirrels (17.4%), raccoon (26.1 %), opossum (34.8%), moles (43.0%), snakes (43.5%), and muskrats (47.8%). These are similar to NWCO customer attitudes reported by Braband and Clark (1992) with some discrepancies.

The results of this study show nuisance wildlife control is an emerging pest control business in urban areas. As this industry

develops, educational programs on wildlife management and animal damage control, with subsequent certification or licensing, will be necessary to: 1) improve the image of the industry, 2) protect the wildlife resource, and 3) educate the public about nuisance wildlife management.

Additionally, because live-trapping and releasing is the preferred control method for many vertebrate species, more research is needed to ascertain what happens to relocated animals. This knowledge will assist the wildlife profession in formulating public-policy decisions related to the nuisance wildlife control industry.

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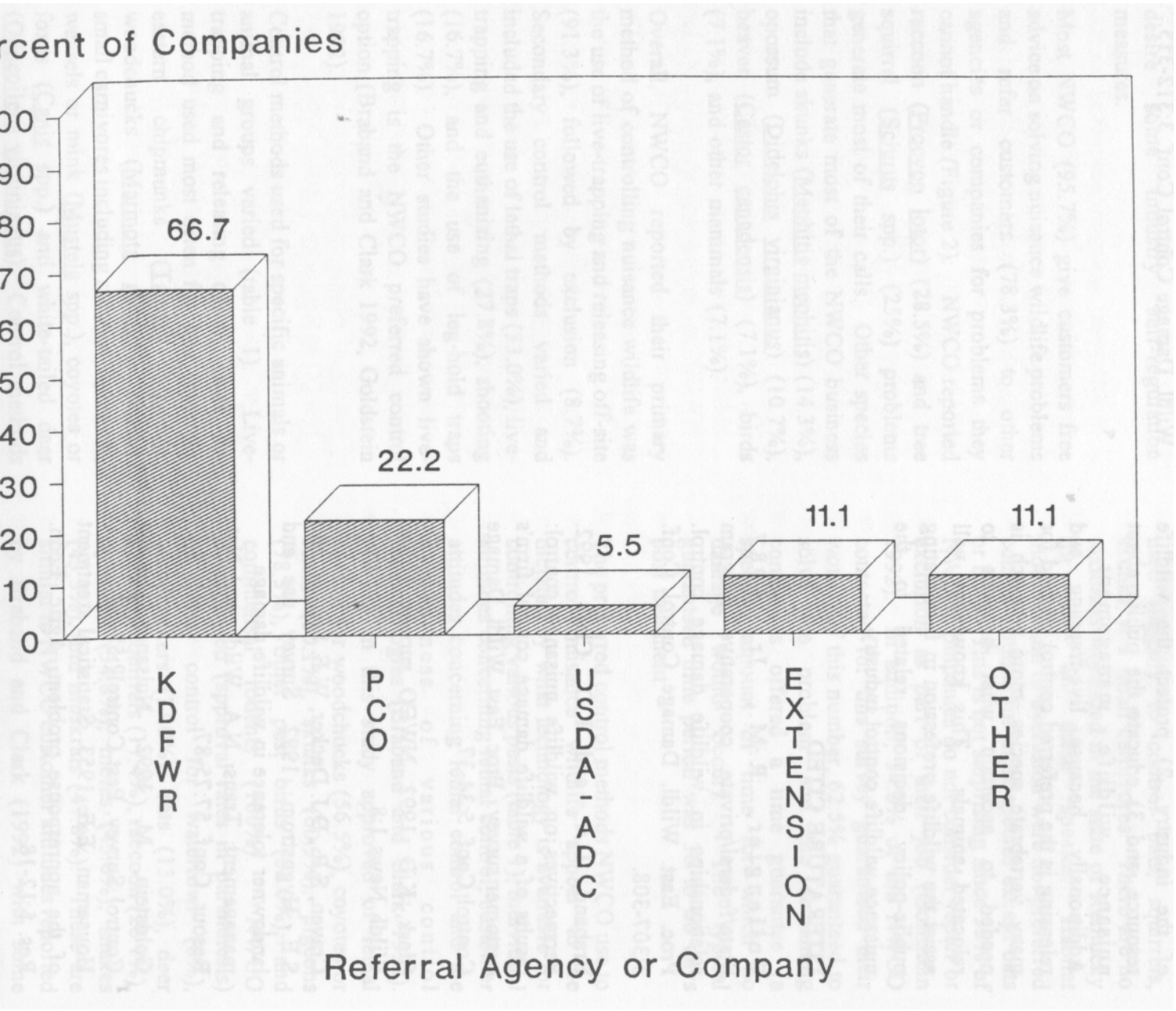
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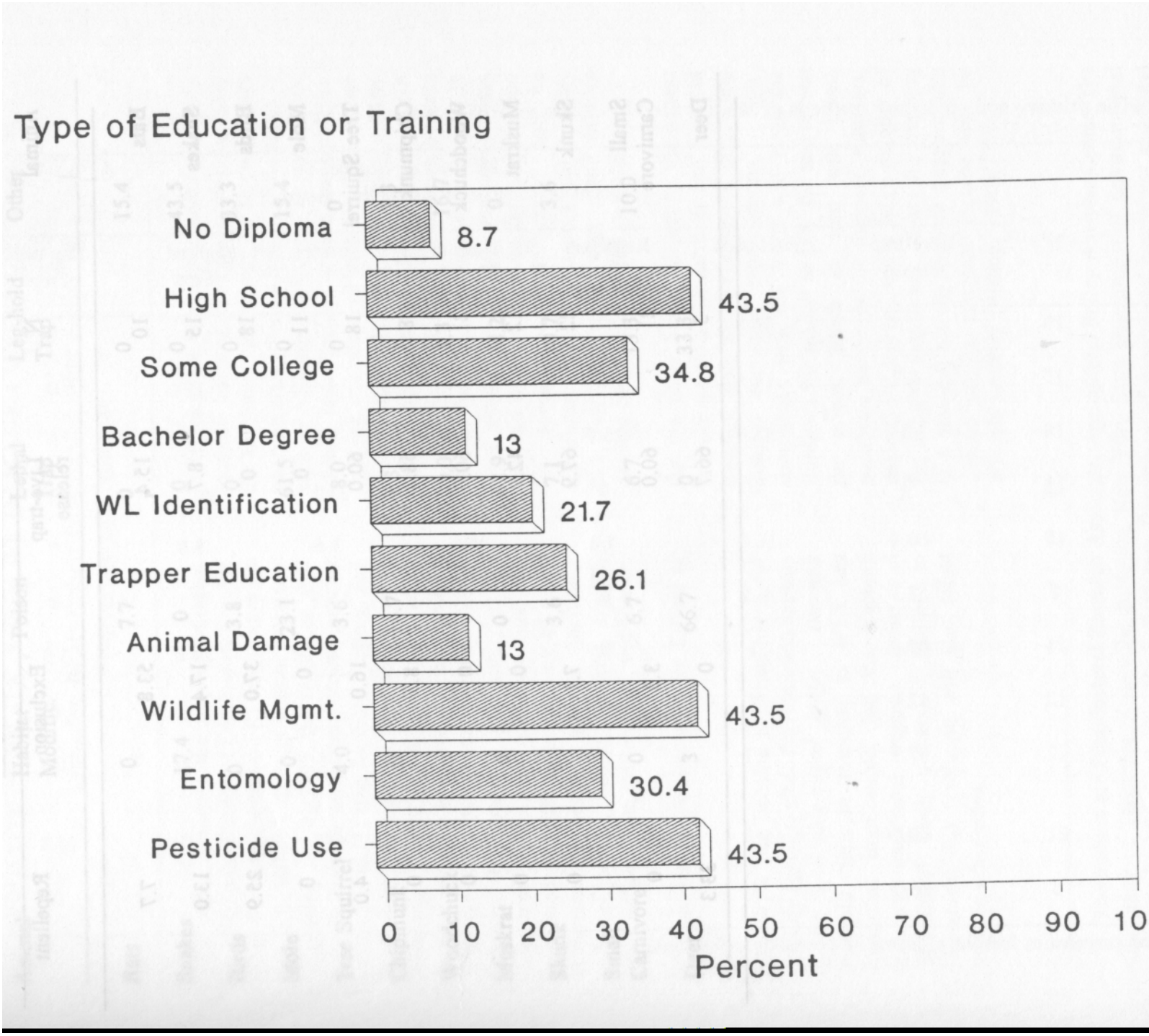
Type of Education or Training
No Diploma
8.7
High School
43.5
Some College
34.8
Bachelor Degree
13
WL Identification
21.7
Trapper Education
26.1
Animal Damage
13
Wildlife Mgmt.
43.5
Entomology
30.4
Pesticide Use
43.5
0
10
20
30
40
50
60
70
80
90
10
Percent

The primary and secondary methods of control used by nuisance wildlife control companies in Kentucky.

		Method of Control (Percent of companies using this method)						
	N'	Live-trap release	Exclusion	Repellent	Habitat Modific.	Poison	Lethal Trap	Leg-hold Trap
	10	15.4	53.8	7.7	0	7.7	0	0
	15	8.7	17.4	13.0	17.4	0	0	0
	18	0	37.0	25.9	0	3.8	0	0
	11	0	0	0	0	23.1	61.5	0
rel	18	60.0	16.0	4.0	4.0	3.6	8.0	0
	8	58.3	8.3	0	0	16.7	8.3	0
k	21	60.0	0	0	0	0	20.0	3.3
	12	42.9	0	0	0	0	42.9	14.2
	22	67.9	7.1	0	0	3.6	7.1	10.7
	21	60.0	3.3	0	0	6.7	6.7	13.3
	3	66.7	0	33.3	3	0	0	0